

CLAIMS

What is claimed is:

- 1 1. A method for determining one or more logical interconnections among a plurality of
2 network devices that are interconnected in a network in an indefinite relationship,
3 wherein a power state is associated with a first network device, the method
4 comprising the computer-implemented steps of:
5 changing the power state of the first network device;
6 identifying whether an alteration occurs at a second network device in response to
7 changing the power state of the first network device; and
8 when the alteration occurs at the second network device, creating and storing first
9 information representing a logical connection of the first network device to the
10 second network device.
- 1 2. The method as recited in Claim 1, further comprising the steps of:
2 retrieving second information from a database, wherein the second information
3 represents one or more logical connections of the first network device to the
4 second network device;
5 comparing the second information from the database with the first information; and
6 generating an error if the second information indicates that a logical connection exists
7 between the first and second network devices but the first information does not
8 indicate that the logical connection exists between the first and second
9 network devices.

1 3. The method as recited in Claim 1, wherein the second network device is a terminal
2 server and wherein the step of identifying whether the alteration occurs at the terminal
3 server further comprises:
4 determining whether a state of a port of the terminal server is changed from dead to
5 active in response to changing the power state of the first network device.

1 4. The method as recited in Claim 1, wherein the second network device is a switch and
2 wherein the step of identifying whether the alteration occurs at the switch further
3 comprises:
4 determining whether a trap on a port of the switch is raised in response to changing
5 the power state of the first network device.

1 5. The method as recited in Claim 1, further comprising:
2 receiving, in response to changing the power state of the first network device,
3 additional information from the first network device; and
4 recording the additional information.

1 6. A method for determining one or more logical interconnections among a set of
2 specified network devices that are interconnected in a network in an indefinite
3 relationship, the method comprising the steps of:
4 (1) establishing connections among a plurality of network devices based upon a set of
5 rules;
6 (2) activating a particular network device of said set of specified network devices;

- 7 (3) identifying whether, in response to activating the particular network device, a
8 change occurs at one or more network devices of said plurality of network
9 devices;
10 (4) when the change occurs at each of the one or more network devices, creating and
11 storing information representing a logical connection of the particular network
12 device to each of the one or more network devices; and
13 (5) repeating steps (2), (3), and (4) for each of said set of specified network devices.

1 7. The method as recited in Claim 6, wherein the set of rules are applied
2 based upon one or more attributes of each connection.

1 8. The method as recited in Claim 7, wherein the one or more attributes of
2 each connection include a type of connection between two or more
3 network devices.

1 9. The method as recited in Claim 7, wherein the one or more attributes of
2 each connection include the number of connections between a specific
3 network device and one or more other network devices.

1 10. The method as recited in Claim 7, wherein the one or more attributes of
2 each connection include that a particular connection is between a first
3 type of network device and a second type of network device.

1 11. The method as recited in Claim 6, wherein the step of identifying whether the change
2 occurs at one or more network devices further comprises:
3 determining whether a trap on a port of each of the one or more network devices is
4 raised in response to activating the particular network device.

1 12. A method for determining how devices are interconnected in a network, the method
2 comprising the computer-implemented steps of:
3 sending a signal from a control device that results in a change in a power state of a
4 first network device in response to the signal;
5 determining whether the first network device is connected to a second network device
6 by identifying an alteration at the second network device that occurs in
7 response to changing the power state of the first network device; and
8 when the alteration occurs at the second network device, creating and storing
9 information representing that the first network device is connected to the
10 second network device.

1 13. The method as recited in Claim 12 wherein the first network device is connected to a
2 power controller and wherein the signal from the control device is sent to the power
3 controller that changes the power state of the first network device.

1 14. The method as recited in Claim 12, wherein the second network device is a terminal
2 server and wherein identifying the alteration at the terminal server includes
3 determining whether a state of a port of the terminal server is changed from dead to
4 active in response to changing the power state of the first network device.

1 15. The method as recited in Claim 12, wherein the second network device is a switch and
2 wherein identifying the alteration at the switch includes determining whether a trap on
3 a port of the switch is raised in response to changing the power state of the first
4 network device.

1 16. A method for determining how devices are interconnected in a network, the method
2 comprising the computer-implemented steps of:
3 power cycling a first network device;
4 identifying whether a suspected link of the first network device and a second network
5 device becomes active as a result of power cycling of the first network device;
6 and
7 when the suspected link become active, creating and storing information representing
8 that the first network device is connected to the second network device.

1 17. A method for developing a representation of a network having a plurality of network
2 devices interconnected in an indefinite relationship, the method comprising the
3 computer-implemented steps of:
4 determining one or more connections of a first type among a first set of network
5 devices;
6 determining one or more connections of a second type among a second set of network
7 devices, wherein the second set of network devices includes the first set of
8 network devices;

9 determining one or more connections of a third type among a third set of network
10 devices, wherein the third set of network devices includes the second set of
11 network devices; and
12 creating and storing information representing the one or more connections of the first
13 type, the one or more connections of the second type, and the one or more
14 connections of the third type.

1 18. The method as recited in Claim 17, wherein the first set of network
2 devices, the second set of network devices, and the third set of network
3 devices each comprise a plurality of types of network devices and
4 wherein each step of determining one or more connections for each set
5 of network devices further comprises:
6 testing the network devices in each set by following a particular order, wherein the
7 particular order is organized by the type of network device.

1 19. The method as recited in Claim 17, wherein the one or more connections of the first
2 type are one or more serial connections, the one or more connections of the second
3 type are one or more Ethernet connections, and the one or more connections of the
4 third type are one or more fiber connections.

1 20. A computer-readable medium carrying one or more sequences of
2 instructions for determining one or more logical interconnections among
3 a plurality of network devices that are interconnected in a network in an
4 indefinite relationship, wherein a power state is associated with a first
5 network device, which instructions, when executed by one or more
6 processors, cause the one or more processors to carry out the steps of:
7 changing the power state of the first network device;
8 identifying whether an alteration occurs at a second network device in response to
9 changing the power state of the first network device; and
10 when the alteration occurs at the second network device, creating and storing first
11 information representing a logical connection of the first network device to the
12 second network device.

1 21. The computer-readable medium as recited in Claim 20, further comprising
2 instructions which, when executed by one or more processors, cause the one or more
3 processors to carry out the steps of:
4 retrieving second information from a database, wherein the second information
5 represents one or more logical connections of the first network device to the
6 second network device;
7 comparing the second information from the database with the first information; and
8 generating an error if the second information indicates that a logical connection exists
9 between the first and second network devices but the first information does not
10 indicate that the logical connection exists between the first and second
11 network devices.

1 22. The computer-readable medium as recited in Claim 20, wherein the second network
2 device is a terminal server and wherein the step of identifying whether the alteration
3 occurs at the terminal server further comprises instructions which, when executed by
4 one or more processors, cause the one or more processors to carry out the step of:
5 determining whether a state of a port of the terminal server is changed from dead to
6 active in response to changing the power state of the first network device.

1 23. The computer-readable medium as recited in Claim 20, wherein the second network
2 device is a switch and wherein the step of identifying whether the alteration occurs at
3 the switch further comprises instructions which, when executed by one or more
4 processors, cause the one or more processors to carry out the step of:
5 determining whether a trap on a port of the switch is raised in response to changing
6 the power state of the first network device.

1 24. The computer-readable medium as recited in Claim 20, further comprising
2 instructions which, when executed by one or more processors, cause the one or more
3 processors to carry out the steps of:
4 receiving, in response to changing the power state of the first network device,
5 additional information from the first network device; and
6 recording the additional information.

1 25. The computer-readable medium as recited in Claim 20, wherein
2 changing the power state of the first network device is in response to a
3 signal from a third network device.

1 26. The computer-readable medium as recited in Claim 25, wherein the first network
2 device is connected to a power controller and wherein the signal from the third
3 network device is sent to the power controller that changes the power state of the first
4 network device.

1 27. A computer-readable medium carrying one or more sequences of instructions for
2 determining one or more logical interconnections among a set of specified network
3 devices that are interconnected in a network in an indefinite relationship, which
4 instructions, when executed by one or more processors, cause the one or more
5 processors to carry out the steps of:
6 (1) establishing connections among a plurality of network devices based upon a set of
7 rules;
8 (2) activating a particular network device of said set of specified network devices;
9 (3) identifying whether, in response to activating the particular network device, a
10 change occurs at one or more network devices of said plurality of network
11 devices;
12 (4) when the change occurs at each of the one or more network devices, creating and
13 storing information representing a logical connection of the particular network
14 device to each of the one or more network devices; and
15 (5) repeating steps (2), (3), and (4) for each of said set of specified network devices.

1 28. A computer-readable medium carrying one or more sequences of instructions for
2 determining how devices are interconnected in a network, which instructions, when
3 executed by one or more processors, cause the one or more processors to carry out the
4 steps of:
5 sending a signal from a control device that results in a change in a power state of a
6 first network device in response to the signal;
7 determining whether the first network device is connected to a second network device
8 by identifying an alteration at the second network device that occurs in
9 response to changing the power state of the first network device; and
10 when the alteration occurs at the second network device, creating and storing
11 information representing that the first network device is connected to the
12 second network device.

1 29. A computer-readable medium carrying one or more sequences of instructions for
2 determining how devices are interconnected in a network, which instructions, when
3 executed by one or more processors, cause the one or more processors to carry out the
4 steps of:
5 power cycling a first network device;
6 identifying whether a suspected link of the first network device and a second network
7 device becomes active as a result of power cycling of the first network device;
8 and
9 when the suspected link become active, creating and storing information representing
10 that the first network device is connected to the second network device.

1 30. A computer-readable medium carrying one or more sequences of instructions for
2 developing a representation of a network having a plurality of network devices
3 interconnected in an indefinite relationship, which instructions, when executed by one
4 or more processors, cause the one or more processors to carry out the steps of:
5 determining one or more connections of a first type among a first set of network
6 devices;
7 determining one or more connections of a second type among a second set of network
8 devices, wherein the second set of network devices includes the first set of
9 network devices;
10 determining one or more connections of a third type among a third set of network
11 devices, wherein the third set of network devices includes the second set of
12 network devices; and
13 creating and storing information representing the one or more connections of the first
14 type, the one or more connections of the second type, and the one or more
15 connections of the third type.

1 31. An apparatus for determining one or more logical interconnections among a plurality
2 of network devices that are interconnected in a network in an indefinite relationship,
3 wherein a power state is associated with a first network device, the apparatus
4 comprising:
5 a means for changing the power state of the first network device;
6 a means for identifying whether an alteration occurs at a second network device in
7 response to changing the power state of the first network device; and

8 a means for creating and storing first information representing a logical connection of
9 the first network device to the second network device, when the alteration
10 occurs at the second network device.

1 32. The apparatus as recited in Claim 31, further comprising:
2 a means for retrieving second information from a database, wherein the second
3 information represents one or more logical connections of the first network
4 device to the second network device;
5 a means for comparing the second information from the database with the first
6 information; and
7 a means for generating an error if the second information indicates that a logical
8 connection exists between the first and second network devices but the first
9 information does not indicate that the logical connection exists between the
10 first and second network devices.

1 33. The apparatus as recited in Claim 31, wherein the second network device is a terminal
2 server and wherein the means for identifying whether the alteration occurs at the
3 terminal server further comprises:
4 a means for determining whether a state of a port of the terminal server is changed
5 from dead to active in response to changing the power state of the first
6 network device.

1 34. The apparatus as recited in Claim 31, wherein the second network device is a switch
2 and wherein the means for identifying whether the alteration occurs at the switch
3 further comprises:
4 a means for determining whether a trap on a port of the switch is raised in response to
5 changing the power state of the first network device.

1 35. The apparatus as recited in Claim 31, further comprising:
2 a means for receiving, in response to changing the power state of the first network
3 device, additional information from the first network device; and
4 a means for recording the additional information.

1 36. The apparatus as recited in Claim 31, wherein changing the power state
2 of the first network device is in response to a signal from a third network
3 device.

1 37. The apparatus as recited in Claim 36, wherein the first network device is connected to
2 a power controller and wherein the signal from the third network device is sent to the
3 power controller that changes the power state of the first network device.

1 38. An apparatus for determining one or more logical interconnections among a set of
2 specified network devices that are interconnected in a network in an indefinite
3 relationship, the apparatus comprising:
4 (1) a means for establishing connections among a plurality of network devices based
5 upon a set of rules;

- 6 (2) a means for activating a particular network device of said set of specified network
7 devices;
- 8 (3) a means for identifying whether, in response to activating the particular network
9 device, a change occurs at one or more network devices of said plurality of
10 network devices;
- 11 (4) a means for creating and storing information representing a logical connection of
12 the particular network device to each of the one or more network devices,
13 when the change occurs at each of the one or more network devices; and
- 14 (5) a means for repeating steps (2), (3), and (4) for each of said set of specified
15 network devices.

- 1 39. An apparatus for determining how devices are interconnected in a network, the
2 apparatus comprising:
- 3 a means for sending a signal from a control device that results in a change in a power
4 state of a first network device in response to the signal;
- 5 a means for determining whether the first network device is connected to a second
6 network device by identifying an alteration at the second network device that
7 occurs in response to changing the power state of the first network device; and
- 8 a means for creating and storing information representing that the first network device
9 is connected to the second network device, when the alteration occurs at the
10 second network device.

1 40. An apparatus for determining how devices are interconnected in a network, the
2 apparatus comprising:
3 a means for power cycling a first network device;
4 a means for identifying whether a suspected link of the first network device and a
5 second network device becomes active as a result of power cycling of the first
6 network device; and
7 a means for creating and storing information representing that the first network device
8 is connected to the second network device, when the suspected link become
9 active.

1 41. An apparatus for developing a representation of a network having a plurality of
2 network devices interconnected in an indefinite relationship, the apparatus
3 comprising:
4 a means for determining one or more connections of a first type among a first set of
5 network devices;
6 a means for determining one or more connections of a second type among a second
7 set of network devices, wherein the second set of network devices includes the
8 first set of network devices;
9 a means for determining one or more connections of a third type among a third set of
10 network devices, wherein the third set of network devices includes the second
11 set of network devices; and
12 a means for creating and storing information representing the one or more connections
13 of the first type, the one or more connections of the second type, and the one
14 or more connections of the third type.